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PHYMATOTRICHUM ROOT ROT DISCOVERED IN UTAH

B. L. Richards, of the Utah State Agricultural College, sends the following preliminary report on the occurrence of the root rot caused by Phymatotrichum omnivorum in Utah. The disease has not previously been known to occur in this State:

"A survey in Washington County, Utah, discovered for us the presence of Phymatotrichum root rot in this particular locality. At present the disease is spread generally throughout the townships of Ivins, Santa Clara, St. George, and Hurricane, and is doing tremendous damage to the various crops. It is evident from our survey that the organism has been in the county probably since settlement by the pioneers and is probably indigenous to the region, as a number of fields exhibited root rot disease the first year after being reclaimed from the native vegetation.

"The area involved is in the extreme southern part of the State at an elevation of approximately 2,000 feet and with a semi-tropical climate. Climatic factors so definitely limit this area that we do not fear the spread of the disease northward into the more productive parts of Utah."

DISEASES OF SPECIAL CROPS

The report headed "Downy mildew on tomato and pepper" in the section on vegetable diseases records the occurrence of a fungus resembling the tobacco downy mildew organism on other hosts in various States. See page 45 for a report on downy mildew in Virginia.

TOBACCO DOWNY MILDEW FOUND IN TENNESSEE

Paul R. Miller reported the occurrence of tobacco downy mildew (Peronospora hyoscyami) in Bradley and Lincoln Counties, Tennessee, May 5. Several beds had been entirely killed out. Later he reported as follows (May 13):

"The downy mildew situation is becoming serious in Tennessee. I have seen it in the plant beds or specimens sent to me, in four more Counties, besides the two I reported to you previously. The additional Counties are: Maury, Monroe, Green, and Blount, and no doubt it is in many more. It is attacking plants 8 to 12 inches high in some cases."

DOWNY MILDEW IN NORTH CAROLINA

E. Y. Floyd makes the following report of the results of a field trip in several Counties of North Carolina:

"The week of April 17, I was in Pender, Duplin, Edgecombe, Pitt, Wayne, and New Hanover Counties. The mildew was seen in a few places in these Counties, but no serious damage was done. There was a considerable amount of tobacco planting in all of these sections. The farmers were about half through which was much earlier than usual. During that week we had considerable rain, hail in sections, and several cold, cloudy days.

"I was through another territory, Wayne, Craven, Carteret, Cumberland, and Wilson Counties, the following week. We could see a considerable spread of the mildew at that time.

"On May 1, I was in Bertie, Edgecombe, Richmond, and Granville Counties, and the disease had reached a very serious stage. Not much tobacco had been planted in the field after April 26. The growers still have not been able to plant very much tobacco in any section.

"In regard to the Piedmont, I have heard from a number of the agents all over that section, and they write me conditions are very serious. During the same week that we had several rainy cloudy cool days, the mildew seemed to spread throughout the State.

"I have had reports from Caldwell County, stating that the disease is very bad there. This was the county where there was no mildew in 1932, and it is the furthest west of any of the flue cured counties, but seems to be attacked twice as bad this year.

"As you know, the growers of the State have sown about double the amount of beds they generally sow for their acreage, and I believe they will be able to plant the acreage they intended to if the mildew will stop spreading for just a few weeks."

DISEASES OF VEGETABLE CROPS

DOWNY MILDEW ON TOMATO AND PEPPER

The following observations of the occurrence on pepper and tomato plants of a downy mildew indistinguishable morphologically from the one now so destructive on tobacco are of interest even though cross inoculations have not yet been made.

On May 22, 1931, R. F. Poole observed in North Carolina tomato plants infected with a downy mildew which he regarded as identical with Peronospora hyoscyami D. By. and sent the following report:

"These plants were gathered along the edge of a tobacco bed, where 95 per cent of plants were diseased. The bed is in a low area where moisture is abundant at all times. The tobacco and tomato plants are both rank in growth. There was no evidence that the disease is causing severe injury to the tomato plant such as was found on the tobacco. The mottling as well as grayish cast symptoms were observed on the tomato."

"The next month (June, 1931) F. A. Wolf reported the following observation for North Carolina:

"It is a common practice among farmers to grow tomato seedlings on the border of tobacco seed beds. In two cases I have noted a Peronospora on tomatoes which appears to be identical with the one on tobacco."

June 7, 1932, George M. Armstrong reported the occurrence of a downy mildew on pepper plants in South Carolina as follows:

"Within a short time after the appearance of downy mildew in the tobacco plant beds, I received diseased pepper plants from Lunn and Lazar, with the statement that these plants came from beds near tobacco beds. They were suspicious that the downy mildew on tobacco might be the cause of the trouble. On the first shipment of seedlings, I did find sporophores of a fungus, which was apparently the downy mildew fungus. Two or three other shipments of plants from various persons arrived about this time and I had difficulty in finding anything like the typical downy mildew fungus.

"May 4, 5, and 6, was spent in the vicinity of Florence when further collections of plants were made. Poured plate cultures were made and incubated at 30°C. Alternaria showed up on a good number of the plates and I had occasionally found Alternaria on the plants examined, but the spots were not typical of those described for Alternaria and I was not at all convinced that this was the cause of the trouble. This morning I again studied some of the dried material and I find a typical downy mildew on the plants obtained from one bed near Darlington. I feel quite sure that we have either the tobacco downy mildew fungus attacking peppers or perhaps the Phytophthora capsici described by Leonian.

"About 500 acres of a hot pepper are grown annually in the vicinity of Florence. A few of the pepper plant beds were destroyed quickly in a similar manner to tobacco beds, in others the damage varied from slight to perhaps 50 per cent of the plants killed. I examined only five pepper plant beds but was told that the disease was rather common."

This year B. B. Higgins has observed injury to both pepper and tobacco plants in Georgia due to a downy mildew indistinguishable from that on tobacco. He writes as follows, May 6, 1933:

"We have in Georgia a new disease of pepper plants which may be of interest to the pathologists of the country, especially those who deal with downy mildew on tobacco.

"As you probably know, middle Georgia has one of the principal Pimiento growing and canning areas of the United States. Between 3,000 and 5,000 acres are planted annually, mostly within the Griffin area. The plants are now ready to set in the fields.

"On April 27, a group of pepper growers brought in specimens of diseased plants and reported that all the beds in their neighborhood were affected. The affected leaves on these plants had turned yellow; then, in further advanced stages the entire leaf or large portions of it had died and collapsed. On very young plants the yellowing and final collapse of tissues extended down the leaf petiole into the tender portions of the stem.

"Examination of the diseased leaves showed the presence of a downy mildew which proved to be a species of Peronospora.

"Since the first report of the disease, several pepper plant beds have been visited. All were infected, some of them appearing as though scalded with steam; and one of the cannery field men reports that all the beds in his territory are diseased. Yesterday a bed was visited in which pepper, tobacco, and tomato plants were all growing. Every tobacco plant in the bed was affected with typical downy mildew. The pepper plants were badly diseased, and there was some mildew on the tomato plants.

"Morphologically the fungus from all three host plants appears to be identical with Peronospora hyoscyami D. By.

"Last year Dr. George M. Armstrong sent me specimens of diseased leaves from pepper plants growing in a field near tobacco in South Carolina. At the time I found a Peronospora on the diseased leaves and suspected its identity with the tobacco fungus, but did not have sufficient material for a careful study.

"Inoculations have been made on tobacco with the pepper fungus; but sufficient time has not yet elapsed for infection to develop."

FRUIT DISEASES

ADDITIONAL NOTES ON APPLE SCAB (VENTURIA INAEQUALIS)

NEW YORK (from Weekly News Letter, May 8): Orange County. (R. Bender). Noticed first apple scab lesion on McIntosh May 1.

Dutchess County (J. A. Evans): Apple scab infection observed May 4, on crabapples and McIntosh. Considerable infection on crabapples on lower and upper surface and leaf stems of early rosette

leaves of McIntosh. No doubt caused by 39 hour wetting period of April 16, 17, and 18.

Ulster County (W. J. Clark): Apple scab primary infection was first observed on crab apple foliage near the leaf margins and points May 1. Found May 2 on Ben Davis, Delicious, crabapple, and on McIntosh May 6.

Wayne County (M. E. Buckman). Apple scab spots plentiful on crabapple, May 5.

PENNSYLVANIA: Observed scab infection May 3, in Delaware County. The heaviest early infection of scab that I have seen for five years in Delaware, Lancaster, York, and Adams Counties. The infection apparently took place on April 15 to 16, or during delayed dormant. (R. S. Kirby).

During the last week I went through my spray area all the way from the New York line to the Maryland line. The unusual amount of rain and damp weather we have had is ideal for scab infection, and not favorable for spraying. Our good fruit growers, however, are doing everything possible, even spraying in the rain, to keep down scab infection.

I found scab infections appearing on the leaves all the way from southern Luzerne County down the Susquehanna River and on through into the Cumberland Valley in Chumberland and Franklin Counties. I think this is about as early a scab infection on leaves as I have noticed for some time. (G. L. Zundel, May 13).

WEST VIRGINIA (from Orchard Spray Service Information, Notice No. 3, 1933): The petal-fall spray will undoubtedly be of major importance this year for control of scab. A considerable proportion of the winter scab spores had matured by April 4, about the beginning of the green-bud stage of the trees. Spores were discharged on April 11, but it is probable that very little infection took place, since it was quite cool and not much foliage was yet exposed.

Heavy spore discharges occurred, however, during the warm rains of April 16 and 17, thus furnishing excellent conditions for infection of the young leaves. Although it is too soon at this writing for such infection to be visible, there is no doubt that plenty of it may be observed by about the first week in May. (E. C. Sherwood).

KENTUCKY: Apple scab ascospores were not found after the buds in the cluster began to separate. Both last year's and this year's perithecia failed to mature after this time. Prepink spray appears to be very necessary. (W. D. Valleau, May 5).

ILLINOIS: Conditions were very favorable for early apple scab infection this spring. The rainy periods of early April caught the growers before they could apply the cluster bud sprays. Mature ascospores were found in abundance in the fallen leaves on February 23. Ascospore discharge on slides occurred on March 28 in the orchard at Urbana. This was before the buds were open. The first infected leaves were found on April 26, at Urbana. Evidently heavy spore discharge

occurred during the first two weeks in April but the rains were so numerous and continuous that it was difficult to secure accurate slide records in the field. I have made two trips through the central part of the State, and find primary scab infection appearing on the leaves in most orchards whether sprayed or unsprayed. We have had very heavy rains and during the last week almost continuous rainy cool weather. Conditions, therefore, are ideal for a bad outbreak of scab this season. Apples are in full bloom at Urbana and the calyx spray is being applied in the neighborhood of Centralia, which is directly east of St. Louis. (H. W. Anderson, May 4).

WISCONSIN: April 27, abundant discharge of ascospores observed from Virginia (crab) leaves brought into laboratory and wet for 30 minutes. Condition of new growth of Virginia in early green tip stage, of Wealthy blossom buds just beginning to crack. April 29, abundant mature ascospores found in perithecia on freshly collected dead leaves of Virginia and Plumb Cider. May 1, discharge of ascospores was observed from freshly collected leaves of Virginia, Plumb Cider, and Wealthy after wetting in laboratory. Condition of new growth of Virginia, late green tip stage; of Plumb Cider and Wealthy in early green tip stage.

Rainy period April 29 to May 1, favorable for infection. Perithecia unusually abundant this season following heavy foliage infection of last season. (R. E. Vaughan, May 5).

PEACH LEAF CURL REPORTED AS ABUNDANT

Peach leaf curl (Exoascus deformans) has been reported as unusually abundant in several States.

PENNSYLVANIA: Observed April 29 in Mifflin County. Heavy infection appearing on unsprayed trees. (R. S. Kirby).

I have noticed an extremely heavy infestation of peach leaf curl occurring all the way from Columbia County down the Susquehanna River and on through into the entire length of the Cumberland Valley including Cumberland and Franklin Counties. Properly sprayed peach orchards are free from peach leaf curl. (G. L. Zundel, May 13).

VIRGINIA: Badly affected specimens brought from the Northern Neck (the peninsula between the Potomac and Rappahannock Rivers) with the statement that the disease is unusually abundant on several farms. (M. B. Waite, May 8).

KENTUCKY: Leaf curl is very severe all over the State except where spraying was very thorough. (W. D. Valleau, May 5).

TENNESSEE: Very abundant in all peach orchards I have visited in this State. Complete infection in many orchards. (Paul R. Miller, May 8).

ILLINOIS: The worst epiphytotic of leaf curl ever experienced by peach growers has appeared in Illinois this spring. It is general over the entire peach area of southern and central Illinois and Indiana. This

was due to the fact that there were almost continuous cold rains and cloudy weather during the latter part of March and the first half of April.

Many growers failed to apply the dormant spray in the fall due to the fact that they wanted to save money in case the crop was killed by winter weather. Low temperatures on February 8 and 9, killed most of the peach buds and growers felt that the cost of dormant spraying was too great with the prospects of no crop. However, enough fruit buds survived to give a light crop in many orchards with the prospect of high prices. Thus those growers who applied the dormant curl spray were very fortunate.

Leaf curl was satifactorily controlled both by fall applications of lime sulfur or Bordeaux oil emulsion and by spring applications when these were made before the middle of March. A survey of the peach curl situation will be made to get more accurate data on the sprays which were most effective and to observe the results of leaf curl on the set of fruit.

In view of the cool, wet weather following the first appearance of peach leaf curl, it will be interesting to note whether we have a secondary infection such as has been indicated by recent articles (in the Reporter 16: 109-110; 171-172). Several years ago we had some rather definite observations which led us to believe that there might be a secondary infection. We did not follow this up at the time. (H. W. Anderson, May 4).

OTHER REPORTS ON PEACH DISEASES

BROWN ROT BLOSSOM BLIGHT IN TENNESSE (Sclerotinia fructicola): Brown rot blossom blight was very severe in eastern Tennessee, killing large twigs in some cases. (C. D. Sherbakoff, May 5).

BACTERIAL SPOT IN ILLINOIS (Bacterium pruni): As in the springs of 1930 and 1931, we are finding the "winter" type of canker in southern Illinois peach orchards. These were very rare in 1932 but seem to be abundant this spring. No bacteria are to be found in the "summer" cankers but the winter ones are crowded and splitting of the bark with oozing of the bacteria has already taken place. The prospects are good for abundant bacterial spot this year. (H. W. Anderson, May 4).

CYTOSPORA CANKERS IN ILLINOIS: A new type of canker has been found very abundantly in peach orchards this spring. This is thought to be due to Valsa leucostoma which ordinarily causes die back or weakened trees. These cankers have been found encircling fairly vigorous twigs. They are light in color as compared with brown rot cankers and are inclined to be decidedly sunken, with very little gum production. (H. W. Anderson, May 4).

DISEASES OF CANE FRUITS IN KENTUCKY

Latham raspberries have come through the winter with over half the canes dead in many fields. In the best of them only about one-third of the buds will grow and fruit.

Black raspberries were very severely injured by cane blight (Leptosphaeria coniothyrium) last August and the disease has continued throughout the winter. W. D. Valleau, May 5).

ROOT ROT ON STRAWBERRY IN MARYLAND

Jehle reports that root rot (undetermined) has occurred in increasing amounts for the past two or three years on the Eastern Shore of Maryland. It is now the most serious strawberry disease problem. In the worst cases, half the plants in the field are dead. It has been observed in Caroline, Somerset, Worcester, Dorchester, and Wicomico Counties. (May 10).

FORAGE CROP DISEASES

BLACK STEM DISEASES OF LEGUMINOUS FORAGE CROPS IN KENTUCKY

Black stem diseases are serious problems in alfalfa and clovers, as indicated in the following reports sent in by W. D. Valleau, May 5.

ALFALFA: Black stem caused by Phoma medicaginis. For the past six weeks or more this disease has been active in alfalfa fields throughout Kentucky. Causes leaf spot, blackening and decaying of young shoots, and in many fields has greatly reduced the stand. Practically all shoots arising from axillary buds have died and living shoots have arisen from below ground. Varietal differences in resistance have been observed. Year in and year out the disease appears to be the most important one on alfalfa in this State. Complete destruction of well established stands is not uncommon.

RED CLOVER: Black stem caused by Phoma sp. Stands of red clover have been completely destroyed by this disease during the past two months. European clovers are most susceptible, Northern and Western clovers less so and strains adapted to Kentucky, Tennessee, and other southern States but slightly affected. Does most injury as a leaf and petiole spot gradually destroying the new shoots. The fungus is active during any warm periods of the winter. It appears to be a major cause of failure of European red clovers in Kentucky.

SWEET CLOVER: Black stem caused by Ascochyta lethalis. Severe as a leaf spot disease frequently destroying all foliage and attacking young shoots so that plants die. It is particularly severe in thick stands of sweet clover.

OTHER REPORTS ON FORAGE CROP DISEASE

CROWN ROT OF RED CLOVER AND ALFALFA IN KENTUCKY (Sclerotinia trifoliorum): Disease was very active on fall sown red clover and alfalfa in January and February. Following a cold, dry period its activity nearly ceased. It was destructive in a field of red clover, two years old, where apothecia were abundant last fall. The organism carries

over from the apothecial stage, to the time when retting occurs, in leaf spots caused by direct ascospore infection. The saprophytic stage, if it exists in the field is of importance only when the parasitic stage is very active. (W. D. Valleau, May 5).

LEAF SPOT OF ALFALFA IN TENNESSEE (Pleosphaerulina briosiana): Completely killed large areas of alfalfa in eastern Tennessee and other areas were defoliated in April. (C. D. Sherbakoff, May 5).

ANTHRACNOSES OF LEGUMES IN KENTUCKY: Northern anthracnose (Kabatiella caulivora = Gloeosporium caulivorum). Active for past week on northern varieties of clover a year old. Causes death of leaves by destroying petioles. O'Gara's anthracnose (Colletotrichum destructivum) has been isolated from alfalfa, red clover, and sweet clover during the winter and spring. On red clover it is now causing a leaf spot. Seems to be a rather common organism on red clover in Kentucky. (W. D. Valleau, May 5).

DISEASES OF ORNAMENTALS.

EXOBASIDIUM MONOSPORUM ON CAMELLIA

Leaves and twigs of Camellia sasanqua sent to H. R. Fulton from Mobile, Alabama, May 1, 1933, by John W. Pace are seriously affected by a whitish bloom similar to that caused by species of Exobasidium. The fungus is unique in that each basidium bears but one spore, a condition anomalous among known American species of the genus. The species appears to be referable to Exobasidium monosporum Sawada (Rept. Dept. Agr. Govt. Res. Inst. Formosa 2: 108-110, pl. 5, fig. 19-23, Dec. 1922. Japanese) which is recorded as parasitic upon Gordonia in Formosa. E. monosporum has not been known hitherto upon Camellia and there is no available record of any experiment or observation which would serve to suggest the possibility of injury by this parasite to other species of Camellia and Gordonia or to other Theaceae, which are important ornamental plants comprising five species native to southeastern United States and some seven exotic species cultivated extensively in the same region. (William W. Diehl).

LILAC BLIGHT IN ILLINOIS

I have a specimen of lilac blight (Phytomonas syringae) from Condit Township, Champaign County, about 14 miles northwest of Urbana. We have obtained specimens in the past from northern and southern Illinois but it has not been reported previously from central Illinois. (H. W. Anderson, May 4).

TOBACCO DOWNY MILDEW IN VIRGINIA

E. E. Clayton reports on a recent survey as follows: On May 15, downy mildew was just appearing in numerous beds near Kenbridge, Lunenburg County, Blackstone, Nottoway County, and McKenney, Dinwiddie County. Further south near Chase City and South Hill in Mecklenburg County the disease had apparently been present for at least two weeks. There is a very high percentage of infection, in fact no tobacco bed was found in the area which was entirely free of downy mildew.

Commercial losses in the area may well be reduced by the fact that the growers having experienced losses from downy mildew in 1932 have in general planted almost double the usual area of plant beds. It is reported that more tobacco cloth was sold in southern Virginia than for many years.